National Institute of Environmental Health Sciences

Characterization of regional influenza seasonality patterns in China and implications for vaccination strategies: Spatio-temporal modeling of surveillance data

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Abstract:

BACKGROUND: The complexity of influenza seasonal patterns in the inter-tropical zone impedes the establishment of effective routine immunization programs. China is a climatologically and economically diverse country, which has yet to establish a national influenza vaccination program. Here we characterize the diversity of influenza seasonality in China and make recommendations to guide future vaccination programs. METHODS and FINDINGS: We compiled weekly reports of laboratory-confirmed influenza A and B infections from sentinel hospitals in cities representing 30 Chinese provinces, 2005-2011, and data on population demographics, mobility patterns, socio-economic, and climate factors. We applied linear regression models with harmonic terms to estimate influenza seasonal characteristics, including the amplitude of annual and semi-annual periodicities, their ratio, and peak timing. Hierarchical Bayesian modeling and hierarchical clustering were used to identify predictors of influenza seasonal characteristics and define epidemiologically-relevant regions. The annual periodicity of influenza A epidemics increased with latitude (mean amplitude of annual cycle standardized by mean incidence, 140% [95% CI 128%-151%] in the north versus 37% [95% CI 27%-47%] in the south, p /Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin)33 degrees N) and April-June in southernmost regions (latitude 0.6 in provinces located within 27.4 degrees N-31.3 degrees N, slope of latitudinal gradient with latitude -0.016 [95% CI -0.025 to -0.008], p

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3864611

Resource Description

Communication:

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience:

audience to whom the resource is directed

Health Professional, Policymaker

Exposure :

weather or climate related pathway by which climate change affects health

Precipitation, Solar Radiation, Temperature

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: China

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Airborne Disease

Airborne Disease: Influenza

Intervention: ☑

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Medical Community Engagement: ☑

resource focus on how the medical community discusses or acts to address health impacts of climate change

A focus of content

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Low Socioeconomic Status

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☒

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☒

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content